

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method to control the post sinter dimensions of a multilayer ceramic substrate sintered under load comprising the steps of:

providing at least one first continuous non-densifying structure;

providing at least one personalized ceramic greensheet having a local peripheral kerf area and an external peripheral kerf area, wherein said external peripheral kerf area will be green sized away before sintering said multilayer ceramic substrate and said local peripheral kerf area will be separated away from said multilayer ceramic substrate after sintering said multilayer ceramic substrate;

placing said at least one first continuous non-densifying structure on the local peripheral kerf area of said at least one personalized ceramic greensheet;

placing said at least one personalized ceramic greensheet having said at least one first continuous non-densifying structure in a stack of personalized greensheets;

laminating said stack of personalized ceramic greensheets to form a green ceramic laminate wherein said at least one first continuous non-densifying structure will at least partially control the dimensions of said green ceramic laminate during lamination; and

sintering said green ceramic laminate under load to form a multilayer ceramic substrate wherein said at least one first continuous non-densifying structure will at least partially control the dimensions of said multilayer ceramic substrate during sintering.

2. (Original) The method of claim 1 further comprising the step of post sinter sizing said multilayer ceramic substrate thereby separating said at least one first continuous non-densifying structure from said multilayer ceramic substrate.

3. (Currently Amended) The method of claim 1 further comprising the steps of:
providing at least one second continuous non-densifying structure;
placing said at least one second continuous non-densifying structure on the external peripheral kerf area of said at least one personalized ceramic greensheet prior to lamination wherein said at least one second continuous non-densifying structure will at least partially control the dimensions of said green ceramic laminate during lamination[[, and]] ; and
pre-sinter sizing said green ceramic laminate thereby separating said at least one second continuous non-densifying structure from said green ceramic laminate prior to sintering.
4. (Original) The method of claim 3 wherein said first and second continuous non-densifying structure is metal, ceramic, polymer, or a combination thereof.
5. (Original) The method of claim 3 wherein said first and second continuous non-densifying structure is a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel and zirconia.
6. (Original) The method of claim 3 wherein said first and second continuous non-densifying structure has a thickness of approximately 0.0003 inch to 0.001 inch and width of greater than 0.5 millimeters.
7. (Currently Amended) A method to control the post sinter dimensions of a multilayer ceramic substrate which is laminated and sintered under load as a multi-up green ceramic laminate comprising the steps of:
providing at least one first continuous non-densifying structure;
providing at least one personalized ceramic greensheet having a plurality of product samples separated by a local kerf area and having peripheral external kerf area, wherein said external peripheral kerf area will be green sized away before sintering said multilayer ceramic substrate and said local peripheral kerf area will be separated away from said multilayer ceramic substrate after sintering said multilayer ceramic substrate;
placing said at least one first continuous non-densifying structure on the local kerf area of said at least one personalized ceramic greensheet;

placing said at least one personalized ceramic greensheet having said at least one first continuous non-densifying structure in a stack of personalized greensheets;

laminating said stack of personalized ceramic greensheets to form a multi-up green ceramic laminate wherein said at least one first continuous non-densifying structure will at least partially control the dimensions of said multi-up green ceramic laminate during lamination; and

sintering said green ceramic laminate under load to form a multi-up multilayer ceramic substrate wherein said at least one first continuous non-densifying structure will at least partially control the dimensions of said multi-up multilayer ceramic substrate during sintering.

8. (Original) The method of claim 7 further comprising the step of post sinter sizing said multi-up multilayer ceramic substrate to form individual multilayer ceramic substrates and thereby separating said at least one first continuous non-densifying structure from said individual multilayer ceramic substrates.

9. (Currently Amended) The method of claim 7 further comprising the steps of:
providing at least one second continuous non-densifying structure;

placing said at least one second continuous non-densifying structure on the external peripheral kerf area of said at least one personalized ceramic greensheet prior to lamination wherein said at least one second continuous non-densifying structure will at least partially control the dimensions of said multi-up green ceramic laminate during lamination[[, and]] ; and

pre-sinter sizing said multi-up green ceramic laminate thereby separating said at least one second continuous non-densifying structure from said multi-up green ceramic laminate prior to sintering.

10. (Original) The method of claim 7 wherein said at least one first continuous non-densifying structure further comprises tailored shapes to control local distortion within said product samples.

11. (Original) The method of claim 9 wherein said first and second continuous non-densifying structure is metal, ceramic, polymer, or a combination thereof.

12. (Original) The method of claim 9 wherein said first and second continuous non-densifying structure is a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel and zirconia.

13. (Original) The method of claim 9 wherein said first and second continuous non-densifying structure has a thickness of approximately 0.0003 inch to 0.001 inch and width of greater than 0.5 millimeters.

14. (Currently Amended) A multilayer ceramic laminate structure comprising:
a plurality of laminated ceramic greensheets;

at least one personalized ceramic greensheet having a local peripheral kerf area and an external peripheral kerf area, wherein said external peripheral kerf area will be green sized away before sintering said multilayer ceramic laminate structure and said local peripheral kerf area will be separated away from said multilayer ceramic laminate structure after sintering said multilayer ceramic laminate structure; and

at least one first continuous non-densifying structure placed on said local peripheral kerf area of said at least one personalized ceramic greensheet.

15. (Original) The multilayer ceramic laminate structure of claim 14 further comprising:
at least one second continuous non-densifying structure placed on said external peripheral kerf area.

16. (Original) The multilayer ceramic laminate structure of claim 15 wherein said first and second continuous non-densifying structure is metal, ceramic, polymer, or a combination thereof.

17. (Original) The multilayer ceramic laminate structure of claim 15 wherein said first and second continuous non-densifying structure is a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel and zirconia.

18. (Original) The multilayer ceramic laminate structure of claim 15 wherein said first and second continuous non-densifying structure has a thickness of approximately 0.0003 inch to 0.001 inch and width of greater than 0.5 millimeters.

19. (Currently Amended) A multi-up multilayer ceramic laminate structure comprising:
a plurality of laminated ceramic greensheets;

at least one personalized ceramic greensheet having a plurality of product samples separated by a local kerf area and having peripheral external kerf area, wherein said external peripheral kerf area will be green sized away before sintering said multi-up multilayer ceramic laminate structure and said local peripheral kerf area will be separated away from said multi-up multilayer ceramic laminate structure after sintering said multi-up multilayer ceramic laminate structure; and

at least one first continuous non-densifying structure placed on said local kerf area of said at least one personalized ceramic greensheet.

20. (Original) The multi-up multilayer ceramic laminate structure of claim 19 further comprising:

at least one second continuous non-densifying structure placed on said external peripheral kerf area.

21. (Original) The multi-up multilayer ceramic laminate structure of claim 19 wherein said at least one first continuous non-densifying structure further comprises tailored shapes to control local distortion within said product samples.

22. (Original) The multi-up multilayer ceramic laminate structure of claim 20 wherein said first and second continuous non-densifying structure is metal, ceramic, polymer, or a combination thereof.

23. (Original) The multi-up multilayer ceramic laminate structure of claim 20 wherein said first and second continuous non-densifying structure is a metal selected from the group consisting of molybdenum, nickel, copper, tungsten, stainless-steel and zirconia.

24. (Original) The multi-up multilayer ceramic laminate structure of claim 20 wherein said first and second continuous non-densifying structure has a thickness of approximately 0.0003 inch to 0.001 inch and width of greater than 0.5 millimeters.
25. (Original) The multilayer ceramic laminate structure of claim 14 further comprising:
discrete tailored shapes to control local distortion within the multilayer ceramic laminate.